

PRELIMINARY AMENDMENT

U.S. Appln. No.: Reissue of U.S. Patent No. 6,511,374

a housing having a feed opening and a discharge opening, a plurality of stationary blades mounted in the housing in axially spaced positions therealong, the stationary blades lying in parallel radial planes;

a chopping assembly mounted in the housing and comprising a hub member mounted for rotation about a longitudinal axis of the hub member and a plurality of blade members mounted on the hub member for rotation therewith about said axis, each blade member lying substantially in a radial plane of said axis and projecting generally outwardly from an inner end at the hub member to an outer end spaced outwardly of the hub member, the blade members being arranged at spaced positions along the length of the hub member such that rotation of the hub member causes the blade members to pass generally between the stationary blades in a cutting action;

the feed opening being arranged to deposit the material onto the chopping assembly in a direction generally inwardly toward the axis and the discharge opening being arranged to allow discharge of the material generally radially outwardly from the chopping assembly;

at least some of the blade members being twisted blade members where each twisted blade is formed from a flat strip to define a mounting portion extending from the inner end of the blade member at the hub to an outer end of the mounting portion, an intermediate portion extending from the outer end of the mounting portion to an outer end of the intermediate portion spaced from the outer end of the twisted blade member and a blade portion extending from the outer end of the intermediate portion to the outer end of the twisted blade member;

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wherein the mounting portion mounted on the hub member is wholly formed from a substantially planar part of the flat strip so that a plane of the mounting portion lies in a radial plane of the hub member;

wherein the strip is twisted only within the intermediate portion about a line longitudinal of the strip;

and wherein the blade portion is wholly formed from a substantially planar part of the flat strip so that the twist in the intermediate portion arranges a plane of the blade portion to lie at an angle to the radial plane with one of the side edges of the blade portion lying in a radial plane offset axially from a radial plane containing the other of the side edges of the blade portion.

12. The apparatus according to claim 11 wherein the strip is twisted in the intermediate portion only about a center line.

13. The apparatus according to claim 11 wherein the strip is of substantially constant width.

14. The apparatus according to claim 11 wherein the plane of the blade portion is at an angle of 90 degrees to the radial plane.

15. The apparatus according to claim 11 wherein the plane of the blade portion is at an angle less than 90 degrees to the radial plane such that said one of the side edges of the blade portion is angularly advanced relative to the other of the side edges.

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16. The apparatus according to claim 11 wherein the side edges of the blade portion are sharpened.

17. The apparatus according to claim 16 wherein each of the side edges of the blade portion is sharpened to a sharp edge lying in one surface of the blade portion.

18. The apparatus according to claim 17 wherein both side edges of the blade portion are sharpened to a sharp edge lying in the same surface of the blade portion.

19. The apparatus according to claim 11 wherein the blade members are arranged in pairs with each one of a pair being arranged on a respective side of one of the stationary blades.

20. The apparatus according to claim 19 wherein the blade members are arranged with the angle of one of the pair being opposite to the angle of the other of the pair.

21. The apparatus according to claim 19 wherein each pair is mounted on a respective one of a plurality of lugs mounted on the hub member at spaced positions thereon, each lug having a pin mounted thereon with a pin axis of the pin parallel to the axis of the hub member such that the pair of blade members can pivot on the pin about the pin axis.

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22. The apparatus according to claim 11 including some flat blade members carried on the hub member each of which is defined solely by a planar cutting portion lying in a radial plane of the hub axis.

23. The apparatus according to claim 22 wherein there are more flat blade members adjacent a center of the hub member than adjacent ends of the hub member.

24. The apparatus according to claim 11 including some flat blade members each of which is defined solely by a planar cutting portion lying in a radial plane of the hub axis wherein the blade members are arranged in pairs with each one of a pair being arranged on a respective side of one of the stationary blades and with the sharpened leading edge of the blade members of each pair arranged adjacent the stationary blade, some of the pairs including one flat blade member and one twisted blade member.

25. The apparatus according to claim 24 wherein there are more flat blade members adjacent a center of the hub member than adjacent ends of the hub member.

26. The apparatus according to claim 11 wherein the plane of the blade portion of at least some of the twisted blade members is at an angle less than 90 degrees to the radial plane such that one side edge of the blade portion is angularly advanced relative to the other side edge and such that the blade portion tends to cause movement of air axially of the hub member and

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wherein at least some of the twisted blade members at each end of the hub member are arranged such that the movement of air caused thereby is directed toward the respective end.

27. The apparatus according to claim 11 wherein the plane of the blade portion of at least some of the twisted blade members is at an angle less than 90 degrees to the radial plane such that one side edge of the blade portion is angularly advanced relative to the other side edge and such that the blade portion tends to cause movement of air axially of the hub member and wherein the twisted blade members at each end of the hub member are arranged such that the total tendency of the movement of air caused thereby is directed toward the respective end.